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U. S. NONFAT DRY MILK IN Israel

Some factors affecting its use

U. S. Department of Agriculture
Foreign Agricultural Service

FAS M-118 June 1961

UNITED STATES DEPARTMENT OF AGRICULTURE

1862 1962

Growth Through Agricultural Progress

Acknowledgements

This study was made in Israel during October and November 1960. The author is grateful to Mr. David L. Hume, Director, Dairy and Poultry Division, Foreign Agricultural Service, and to Mr. D. R. Strobel, Deputy Director, for direction and assistance in planning and outlining the scope of the study.

Appreciation is expressed to Mr. Grover C. Chappell, U.S. Agricultural Attache, and his staff, and to various other people in the American Embassy in Tel Aviv; to Dr. George L. Peterson, Chief, Agriculture Division, and Mr. Ben K. Schuman, Livestock Sanitation Specialist in the United States Operations Mission, International Cooperation Administration, also in Tel Aviv; to Mr. Shlomo Wagschall, Secretary of the Israel Dairy Board; to Dr. Sarah Bavly in the Ministry of Education and Culture and to other government officials in the Ministries of Agriculture, Welfare, Commerce and Industry, and Finance; to the Bank of Israel; and to numerous representatives of the dairy industry in that country who assisted in making available basic information used in this study.

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U.S. NONFAT DRY MILK IN ISRAEL

Some Factors Affecting Its Use

By W. Bruce Silcox*

Summary

During recent years the consumption of nonfat dry milk in Israel on a per capita basis has probably been the highest in the world. This has been accomplished by substantial imports of this product from the United States. The contribution that these shipments have made to the nutritional level of a struggling immigrant people has been recognized as significant. At the same time the overall consumption of milk per capita in Israel, including fluid milk and the milk equivalent of milk products used, is relatively low.

Since 1951, annual average shipments of U.S. nonfat dry milk to Israel have exceeded 19 million pounds. During the past 5 years the rate of shipment to that country has exceeded 22 million pounds per year, although in 1960 these exports declined sharply. Inasmuch as the population of Israel has ranged from less than 1.6 million persons in 1951 to only slightly more than 2 million people at present, shipments of nonfat dry milk per capita to that country may be considered to have been relatively high.

The bulk of the nonfat dry milk shipped to Israel during 1958 and 1959 was purchased by the Government of Israel under Title I of Public Law 480. This milk was used principally in the preparation of cultured milk drinks and several types of soft cheese for commercial sale. Smaller shipments were made for distribution to approximately 230,000 children in 1,410 schools and for distribution through authorized welfare agencies to other needy persons. Authorities in both the Ministry of Education and Culture and the Ministry of Welfare speak very highly of the contribution this milk has made in improving the nutritional standard of the recipients.

The policy of the Government of Israel has been to assist the dairy industry to high peaks of production. Coincident with the importation of U.S. nonfat dry milk during the last decade, the production of milk and milk products in that country has expanded threefold. Currently, both the dairy industry in Israel and the government seek to help the country become self-sufficient in milk and milk products.

During the period 1949 to 1960, the number of cows in Israel increased from 20,700 to 64,000. In the same period, production of cow's milk rose from 210 million pounds to 617 million. Goat's and sheep's milk showed an even greater rate of increase. The land of Israel for the most part is stony or sandy. Extensive systems of irrigation are necessary and the production of feed is expensive. To assist in the development of the dairy industry, the government has engaged in payments of direct subsidies. For the agricultural year ending September 30, 1960, this subsidy was equivalent to $6.2 million. During the previous year it was nearly $9 million.

Although in the aggregate the total quantity of milk consumed in Israel has increased during the past 10 years, the consumption of fluid milk per capita has not kept pace with the increase in production. Also, the rate of consumption of fluid milk per capita is currently about 60 percent of what it is in the United States and appreciably lower than the rate in a number of other countries. Per capita consumption of milk and milk products per year, in terms of milk equivalent, is just about one half what it is in the United States. The influx of many immigrants of oriental origin [1] whose consumption of milk is considerably below that of immigrants from most European countries, the increased supply of competing products such as meat, fish, and eggs, and the absence of well-organized promotional and merchandising efforts, all help to explain the prevailing relatively low consumption of milk per capita. The consumption of animal proteins per capita in Israel is also about half what it is in the United States.

Goals for the production of milk embrace an increase in the number of milk cows by 1968 to 80,000 and the production of more than 750 million pounds of milk annually. There is every indication that these targets will be reached. The dairy industry does not look favorably on the importation of dairy products for dollars. The government currently appears to share this view. This, of course, greatly limits the prospects for strictly commercial shipments of U.S. dairy products to Israel in the foreseeable future.

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[1] Relates here to immigrants of North African, Near Eastern, or Asian origin.

U. S. Shipments of Nonfat Dry Milk Relatively High

During the 10-year period 1950-59, total shipments of U.S. nonfat dry milk to Israel exceeded 192 million pounds, an average of more than 19 million pounds annually. In 1955-59, shipments on the average exceeded 22 million pounds per year. From 1950 through 1959, exports of nonfat dry milk to Israel ranged from a low of 7.2 million pounds to a high of 25.7 million.

TABLE 1. -- Nonfat dry milk: U. S. exports to Israel, 1950-60

Year	U. S. exports to Israel	Year	U. S. exports to Israel
	Million pounds		*Million pounds*
1950	7.2	1956	22.4
1951	9.8	1957	18.8
1952	20.1	1958	24.2
1953	18.1	1959	24.0
1954	25.7	1960	[1]
1955	21.2		

[1]Preliminary data indicate less than 1 million pounds.

During 1960, imports of nonfat dry milk in Israel declined sharply, owing in part to the government's general policy of assisting the domestic dairy industry to meet the needs for milk and dairy products more fully and also because accumulated stocks did not seem to require the importation of additional quantities. In the main, however, it would appear that inasmuch as the population of Israel has ranged from about 1.6 million persons in 1951 to only slightly more than 2 million in 1960, U. S. exports of nonfat dry milk per capita to that country may be considered to have been relatively high.

By far the bulk of U.S. shipments of nonfat dry milk to Israel during 1958 and 1959 were made under Title I of Public Law 480, which provides for the sale of surplus U. S. agricultural commodities for foreign currencies. This milk has been used principally by the dairy industry to supplement the domestic supply of milk for manufacturing products made with the use of culture, such as yogurt, leben, and lebenia, and in the manufacture of several varieties of soft cheeses.

Although somewhat smaller U.S. exports of nonfat dry milk for school lunch purposes were made prior to 1956, shipments to Israel for that purpose since 1955 have averaged 1.2 million pounds per year. No shipments have been made under Title II of Public Law 480, "to meet famine or other urgent or extraordinary relief requirements." However, under Title III of that law, more than 11 million pounds have been made available since 1955 to nonprofit voluntary agencies in Israel for distribution to needy persons.[2]

For the 41 million pounds of nonfat dry milk shipped to Israel under authority of Title I, P.L. 480 during 1958 and 1959 (which represents nearly 85 percent of the total exports of that product to Israel during those 2 years), the average price was equivalent to approximately 8.2 cents per pound.

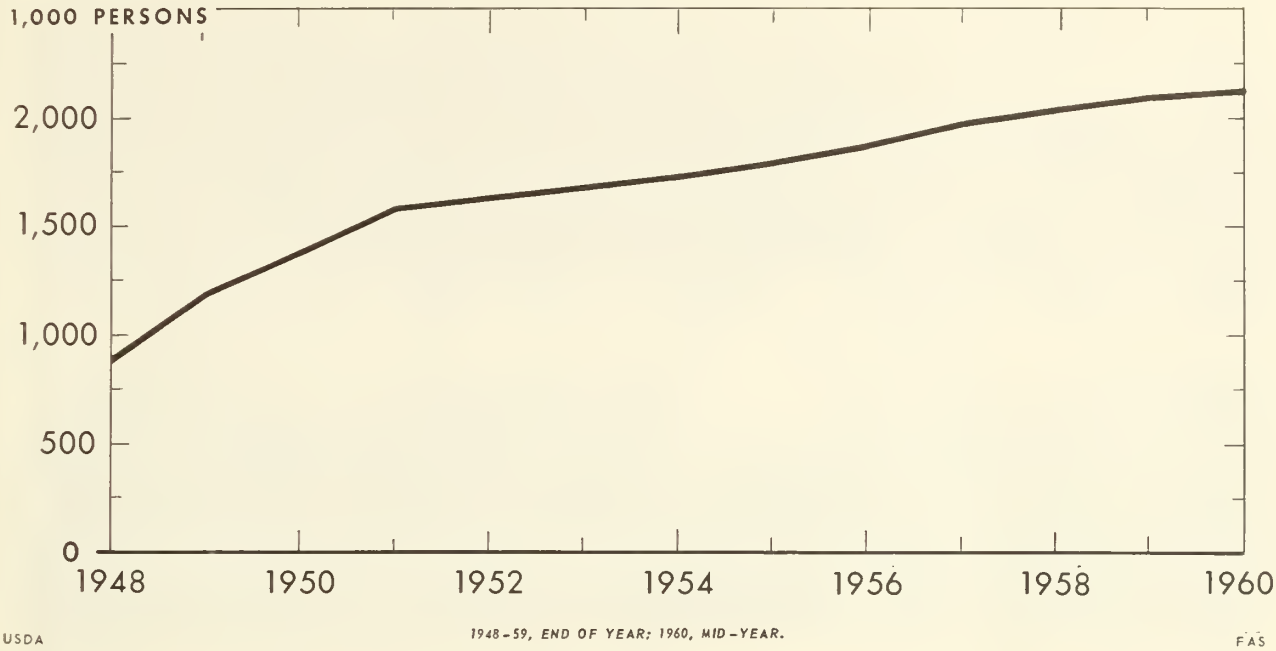
Israel's Agriculture Has Ancient Roots

In order to best understand the conditions under which the dairy industry is carried on in Israel, a brief review of the history and organization of the country's agriculture is pertinent.

Early experience of people was difficult. -- Although modern Jewish agricultural settlement in the territory that now constitutes Israel dates back to 1870, the agricultural traditions of the Jewish people are much more ancient. The Jews emerged into history as a nomadic people pasturing their sheep and goats on the hillsides. The Bible portrays them as peasants, cultivators, and fishermen. After the Roman conquest about 63 B.C., Jewish independence was destroyed and

[2]Dr. George L. Peterson, Chief, Agriculture Division, United States Operations Mission, International Cooperation Administration, Tel Aviv, Israel.

Israel's Population Growth in its First 13 Years



the people were scattered widely throughout the world. Regarded in most countries somewhat as a race apart, the Jewish wanderers tended in their new lands to seek out a means of livelihood outside agriculture. Unable to acquire land in many countries, this people of peasants became transformed into an almost exclusively urban race.

Agriculture resumed late in 19th century. -- It was not until 1878 that a small group of Jerusalem Jews purchased land and set out to establish their own village. In this they were joined later by immigrants from Hungary, Russia, and other European countries. By 1900 there were already 22 Jewish villages in Palestine. Improved methods for growing citrus crops and vines were introduced. Olive cultivation was expanded and local projects of swamp drainage were introduced. The eucalyptus tree was introduced from Australia. Progress was slow. There was a growing awareness that agriculture was not only a way of life but a science that had to be studied. The real turning point in Jewish agricultural development came in the first decade of the twentieth century. Certain weaknesses in the system of individualistic farming stimulated the development of collective village living. Early attempts at the cooperative village setup did not succeed, but provided a great stimulus to the cooperative idea. Consequently, growth took place in both the kibbutz and moshav types of agricultural settlement (described later).

In the 1930's a new type of agricultural settler appeared. The flight from Hitler's Germany brought many middle-aged people to Palestine. These people turned to agriculture for their living and created new smallholders' villages. The major emphasis was placed on dairy and poultry farming and vegetable production. Poultry breeding in particular, for both meat and eggs, received a great stimulus from this type of settler. During World War II the organization in Jewish villages resulted in a significantly higher level of nutrition than was possible during, for example, the days of World War I. By 1948 there were 256 Jewish agricultural settlements in the country with a total of 105,000 people. By this time a second generation was emerging and a Jewish farmer was no longer an oddity.

Transformation was rapid after 1949. -- After the creation of the State of Israel on May 14, 1948, a sharp transformation took place in Jewish agriculture. Possibilities for land settlement

increased from less than half a million freely accessible acres to 10 times that area, although most of it was uncultivated.

Restrictions on Jewish immigration had been removed, and between May 1948 and the end of 1951 more than 685,000 Jewish immigrants entered the country.[3] This necessitated quick and large-scale agricultural development. The new population needed to be fed, housed, and employed. Also the country had to be organized for possible defense. The importance of a chain of villages to serve if need be as a rampart had been demonstrated. What actually has taken place has been a great "agricultural offensive" during which people poured into rural areas, quickly developed the irrigated and cultivated areas, and raised the output of agricultural products from less than a subsistence level to substantial exports of certain commodities. During the 10 years 1950-59, the area under irrigation increased more than fourfold to a total of 310,000 acres. In the first 3 years of this period, efforts were made to bring good soil into use. Currently, almost all the land suitable for agricultural use without special reclamation work is under cultivation.

Present Agricultural Organization Is Unique

Although there are privately owned or "independent" farms and plantations in Israel, the majority of the immigrants were faced with an almost entire lack of capital; and to cope with the difficulties of individual farming on stony hills and marshy plains, they turned to settlement by groups. With assistance from national and international Jewish institutions, they undertook production, clearing and cultivating the land collectively, pooling their meager resources, and sharing the fruits of their toil. From this origin springs the most characteristic pattern of Israeli agriculture. The system embraces the most rigid forms of collectivism along with looser types of cooperation and individual cultivation.

The result has been the development of about 750 villages of various types, established during the last two generations. Nearly 500 of these have sprung into being since 1948. One of the cardinal factors making possible the remarkable expansion in dairy and agricultural production has been national ownership of the land. About 90 percent of the land in Israel is owned by the state or administered through the Jewish National Fund. Land held in trust by the latter is let out on 49-year leases to families able and willing to till it. Much the same principles are observed in the administration of state lands.

The general practice is for the agricultural people to live in villages with their farmland extending out from this central location.

The two principal types of agricultural villages are identified by the plural terms, kibbutzim and moshavim. The kibbutz is a communal or collective settlement. All property is collectively owned and work is organized on a collective basis. The members give their labor and are supplied in turn with housing, food, clothing, education, and cultural and social services. There are central dining rooms and kitchens, communal kindergartens and children's quarters, communal social and cultural centers, and central stores. Individual living quarters provide personal privacy. The kibbutz is governed by the general assembly of all members. The kibbutzim are predominantly agricultural but many maintain sizable industrial enterprises. The population of each ranges generally from 60 to 2,000 persons. Less than 30 percent of the present agricultural population live in kibbutzim; 10 or 12 years ago this share was closer to 50 percent.

The other significant type of agricultural development, the moshav, originally was an ordinary village based on private land ownership and private enterprise. A modification of this type of village, comprised of cooperative smallholders, is known as the moshav ovdim. This form of moshav settlement, the most prevalent, is based on principles of mutual aid and equality. Each individual farm is worked by the member and his family, but he sells his produce and buys his supplies and equipment through a central cooperative which also acts as a credit agency. Certain types of agricultural equipment may be owned by the settlement as a whole. This type of settlement is purely agricultural and its population ranges from 100 to 1000.

More than 60 percent of the farm families live in cooperative smallholders' settlements of this type. Most of the new settlers in the last decade have turned to this form because it appears to combine in an easy and useful way the individual and the cooperative ways of life.

Still another somewhat similar but less prevalent type of moshav is the smallholders'

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[3]As of mid-1960 the population of Israel was 2.2 million, of whom more than 88 percent were Jews. Moslems, Christians, and Druzes made up the remaining 12 percent. Thirty-five percent of the total population is located in the three cities of Tel Aviv-Jaffa, Haifa, and Jerusalem.

Nearly 40 years of hard work have gone into Kibbutz Beit Alfa in the Valley of Yezreel. Above, the tent colony of the earliest times, in 1922. At left, today's thriving settlement, nestled among its neat fields at the foot of the same stony mountains.

settlement often referred to as the "middle class " settlement. In these, the ideological basis is less rigid. For example, hired labor is permitted. These villages, like the others described, are predominantly agricultural.

At the end of 1959[10], the actual number of farm units in Israel, according to type of settlement, was as follows:

	Farm Units
Kibbutzim and cooperative settlements	6,873
Moshavim and extension of veteran settlements	16,647
"Middle class" settlements	1,504
Total	25,024

On the basis of 64,000 milk cows in the state, the average number of cows per farm unit is 2.5.

Cooperative organization is the rule. -- Cooperative enterprise is highly developed in Israel. Most of the agriculture, almost all the passenger transport by road, an important part of industry, retail and wholesale trading, and various services are handled by cooperative associations.

At the end of 1958 there were 2,427 cooperatives with a total membership of 750,000. Distribution of this number by type was as follows:

Farm, kibbutzim, moshavim, agricultural associations	869
Producer cooperatives and services	254
Transport cooperatives	30
Housing cooperatives	447
Consumer cooperatives	294
Provident funds	362
Credit cooperatives	67
Others	104
Total	2,427

About 90 percent of Israel's agricultural production is handled or controlled by three cooperatives, Tnuva, Tenna, and Amir. The largest of these is Tnuva, which handles roughly 70 percent of total agricultural production for domestic consumption. Over 80 percent of the milk produced in Israel is handled by this cooperative. The marketing cooperatives have their own cold stores and creameries, as well as packinghouses and canneries. They deal also with exports either directly or through subsidiaries - this is particularly true regarding citrus fruits, peanuts, and eggs.

Agriculture Important in the Economy

Principal agricultural and food products of Israel currently consist of citrus and other fruit, vegetables, eggs, milk, wheat, barley, tobacco, peanuts, cotton, sugar beets, beef, fish, canned fruits and vegetables, fruit juices, and wine. The main industrial products are fertilizers, cement, polished diamonds, metal products, ceramics, tires and tubes, plywood, textiles, and clothing.

The national income originating in agriculture in 1958-59 amounted to 377 million Israeli pounds, the equivalent of US$209.4 million. The next year it was I£394 million (US$219 million).[4] This is approximately 13 percent of the total national income at current prices. Milk represents about 11 percent of the value of agricultural production. On the whole, Israel's agriculture is now highly mechanized. The total value of agricultural and dairy production has increased since 1948 by more than 300 percent.

Israel is a net importer of agricultural products. In 1959, agricultural imports amounted to the equivalent of roughly US$100 million, or 22 percent of the value of all imports. During the same year agricultural exports were equivalent to approximately $60 million. These, however, accounted for about 40 percent of the value of all exports. Between 1950 and the latter part of 1960, Israel's gold and foreign exchange increased from the equivalent of $30.5 million to approximately $180 million.

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[4] Calculations on basis of official rate: US$1 = I£1.80.

Picturesque as an old European hill town is the moshav of Rosh Pina in Upper Galilee (left), one of the first agricultural settlements. Below is one of the latest—Tselafon, a moshav set up in the Judaean hills for newly arrived immigrants.

Government Farm Policy Has Been To Expand Production

The principal objectives in Israel's agricultural policy may be stated briefly as follows:

1. To increase the supply of food and to replace imports by local produce.
2. To supply raw material for food processing and other industries.
3. To export an increasing proportion of the produce of those branches in which local consumption is fully met.

To achieve these objectives the following are among the methods employed [7]:

1. The extension of the cultivated area by establishing new villages and enlarging old ones.
2. Improving crop yields by careful selection of seed, use of fertilizers, and mechanization.
3. Land reclamation and soil conservation to reclaim areas at present unusable and to preserve land now in use.
4. The exploitation of all available water resources for irrigation.

Subsidies used extensively.-- To assist agricultural expansion and to direct it toward desired goals, wide use has been made of government subsidies. In some areas, however, the amounts of these have been gradually reduced. Originally subsidies in agriculture were paid somewhat indirectly by allowing farmers' organizations to obtain imported fodder, milk powder, fishmeal, farm implements, and other materials at reduced prices. At present they are paid mostly in cash for specific programs. This has been done by increasing prices to farmers for produce sold in the local market, as with milk and cotton; by compensating for disposal of seasonal surpluses, as with vegetables; by encouraging production in new settlements, or by offering an incentive premium for exports, with eggs and peanuts. In 1957-58 total subsidies paid amounted to the equivalent of $25.1 million. For the agricultural year October 1, 1959, through September 30, 1960, however, less than half that amount was budgeted -- the equivalent of $12.1 million. Of this, nearly two-thirds was to be recovered by surcharges levied on fodder crops.

During the first 2 years of the decade, the subsidy paid to the dairy industry by the government during certain months only did not exceed the equivalent of $280,000 altogether. Prior to December 1953 variable exchange rates were effective. Table 2 shows subsidy payments during the later years of the decade.

Marketing agreements and separate commodity boards have been used with some commodities to better regulate agricultural production and marketing.

TABLE 2. -- Dairy industry: Subsidy payments by the Government of Israel, agricultural years 1953-60

Year ending September 30	Payments in --		Year ending September 30	Payments in --	
	Israel pounds	U.S. dollar equivalent		Israel pounds	U.S. dollar equivalent
	Millions	*Millions*		*Millions*	*Millions*
1953	2.1	1.1	1957	9.0	5.0
1954	3.5	1.9	1958	11.1	6.2
1955	4.3	2.4	1959	15.9	8.8
1956	7.5	4.1	1960	11.25	6.2

Letter from Shlomo Wagschall, Secretary of the Israel Dairy Board, Tel Aviv, October 25, 1960.

Government advice aids dairy industry. -- Each rural district or settlement is served by a veterinary surgeon with his own means of transportation. The Ministry of Agriculture operates a veterinary laboratory and sends instructors to all rural settlements, especially new ones. Artificial insemination is widely practiced; the Cattle Breeders Association has a number of well-equipped stations for this purpose. It also cooperates with the government in the importation of cattle and keeps a herd book. Modern sanitary methods in the barns have been developed under the guidance of the United States Operations Mission, the Food and Agriculture Organization, and the Israel Ministries of Health and Agriculture.

Israel's Dairy Industry Has Moved Forward

Although conditions for expansion have been difficult, the dairy industry in Israel has made rapid strides since 1949.

Agricultural resources are limited. -- Comprising as it does a land area of 7,819 square miles, the country is only slightly larger than the State of New Jersey. It lies in a region of both desert and moderate climate, with summers hot by day and winters mild. About 30 percent of the land area is planted in crops or can be used for grazing; but the size of the arable area is restricted by the scanty precipitation, which ranges roughly from 1 inch or less annually in the south to possibly 37 inches in the north. October through May may be considered as the rainy season. However, most of the rain falls during December, January, and February.

Temperatures in Israel are relatively high for optimum conditions for milk production. A review of average mean temperatures in four selected regions during 1959 shows a range from 41.4° F. during February to 83.5° F. during June. But, because even during the hottest weather the nights become noticeably cooler, mean temperatures do not accurately reflect how very warm it becomes during the day. Observation of mean maximum temperatures in the same areas during a similar period shows a range from 46.7°F. to 95.7° F.

TABLE 3. -- Monthly mean temperatures in four selected areas, 1959

Area	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.	°F.
Tel Aviv (coastal plain)	57.6	52.2	57.4	62.4	68.2	74.7	77.4	78.8	75.7	69.3	64.6	59.5
Beersheba (south Israel)	54.0	47.1	55.6	64.9	70.7	75.6	76.1	76.5	73.0	66.9	62.6	56.8
Tiberias (lower Galilee)	59.4	52.5	60.4	71.2	79.0	83.5	–	–	82.0	75.9	69.6	64.8
Jerusalem	50.5	41.4	51.3	62.4	68.9	72.7	71.4	73.2	70.0	65.5	60.4	54.5

Statistical Abstract of Israel, 1959-60, Government Printing Office, Jerusalem, 1960.

Feed presents a problem. -- Forage crops can be successfully produced but intensive irrigation is required. The water resources of the country are limited and irrigation is expensive. A large part of the feed concentrates is imported, as is much of the dairy equipment in barns and dairies. Foreign currency for these imports, however, has not always been easy to obtain. Notwithstanding, progress has been substantial.

Cattle numbers increasing. -- Between 1949 and 1960 the number of milk cows "in Jewish farming"[5] increased from 20,700 to at least 64,000 -- more than 3 times the 1949 figure. Increases in the numbers of heifers and calves were similar. Numbers of beef cattle apparently increased during the same period from several hundred head to upwards of 40,000 (6).

The dairy cows in Israel are principally Holstein-Friesian or a cross between the Holstein-Friesian and Damascus breeds. These animals seem to have adapted themselves to the country and exhibit the necessary characteristics of high milk yield and resistance to heat. The high cost of raising cattle has required constant selection of cows in the herd. The average yield of milk per cow approximates 8,800 pounds of milk per year, and some settlements report an average yield in excess of 13,000 pounds.

Prices received by producers have varied widely. -- During the agricultural year 1960, the average price paid producers for milk in Israel was 27.6 agorot per liter. Based on 100 agorot per Israeli pound and the official exchange rate of 1 U.S. dollar per 1.80 Israeli pounds, the price received by producers per hundred pounds was $6.96. During 1959 the average price received by producers for all milk sold wholesale in the United States was $4.15 per hundred pounds. Preliminary data would indicate that for 1960 the average price in this country will

[5] Data regarding other than Jewish farming during this period are scanty, but are of less importance and not considered sufficiently reliable to be included here.

TABLE 4. -- Milk cows: Number in Jewish farming, end of year, 1948-59

Year	Number	Year	Number
1948	19,065	1954	38,370
1949	20,770	1955	36,500
1950	25,645	1956	40,000
1951	31,690	1957	44,000
1952	35,105	1958	55,000
1953	37,240	1959	63,000

Statistical Abstracts of Israel, Nos. 9 and 10, Jerusalem.

have been 3 to 4 cents per hundred pounds higher than in 1959.

During the agricultural year 1950, in Israel, producers received 7.5 agorot per liter for milk marketed. In that period the official rate of exchange was such that 1 U.S. dollar was equivalent to 0.3571 Israel pound. On that basis, during 1950, producers in Israel received the equivalent of an average price of $12.16 per hundred pounds for milk. In view of the several changes in the rate of exchange in Israel in 1949-60, and the difficulty in determining the specific quantities of milk marketed under each rate of exchange, annual prices received by producers between 1950 and 1959 are not shown.

Methods of milking are modern. -- The general practice in the settlements is for milking to be performed by mechanical milking machines. Milking parlors where cows come in rotation to be milked are also used. Milk produced in parlors may be transferred from an autorecorder directly to tank coolers in which it is kept at a temperature of approximately 40° F. until delivered to the collection station by the producer or by a privately owned or jointly operated tanker.

During recent years the souring of milk has been greatly reduced and there seems to have been a significant improvement in the quality of milk produced(1). Improved methods of cooling, both on the farms and at the collection stations, have greatly contributed to this achievement. Where cows are milked by bucket-type machines or by hand, the milk is cooled either on the premises or at the nearest collection station, or both.

"Package type" collection stations increase. -- A more recent development in the assembly of milk from farms has been the "package type" milk-collecting station, largely developed and initiated through technical assistance[6] provided by the United States Operations Mission. This type of station combines special features for receiving, pumping, cooling, and storing the milk, washing the cans and assisting producers to qualify for a quality premium. Keen and widespread interest has been indicated in this type of installation. Between 30 and 40 moshavim are seeking to shift to it from present methods, and some other countries have expressed an interest in it.

The development, transition, and modernization outlined above has occurred during a relatively short time. To make financing of these projects possible, the Government of Israel has extended loans and credit on favorable terms to the settlements. The payment of quality premiums by dairies has also been a factor in improving the quality of the milk produced.

Tank-truck transportation replaces cans. -- For transporting milk in Israel, tank trucks are rapidly replacing cans. Both stationary holding tanks and tankers for transport use are of stainless steel construction and are large enough to contain standard quantities, in contrast with earlier ones, which were considerably smaller. The larger tankers may collect from 8 to 10 stations or settlements. Mixing the milk from several stations does not cause deterioration in quality when milk is well cooled.

Milk samples for methylene blue (reductase) and butterfat tests are taken by the driver at the farm and maintained at low temperatures. Large tankers contain two bulk compartments. Some tankers are owned by settlements, others by private contractors. The advantages of bulk hauling as compared with cans were greatly reduced milk losses from transfer, elimination of

[6] Bernard K. Schuman, Livestock Sanitation Specialist, United States Operations Mission, International Cooperation Administration, Tel Aviv, Israel.

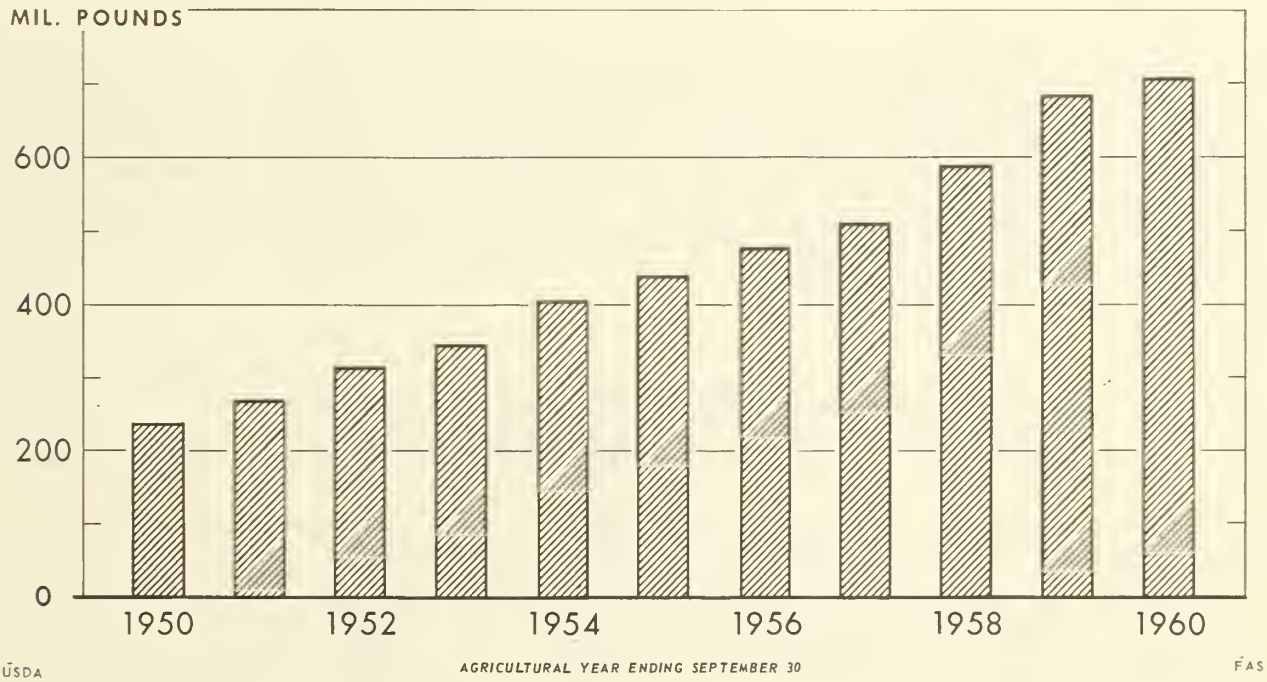
can leakage and adhesiveness to lids, less milk going sour in transit, fewer complaints regarding butterfat content, and a reduction of 30 to 40 percent in hauling costs. More than 60 percent of the milk produced in the country is hauled by tankers, and this in spite of a substantial increase in the production of milk each year. Israel has a well-developed network of good roads, reaching nearly every settlement.

Dairy products processed in few plants. -- The processing of milk into bottles for fluid use and into manufactured products is done in a relatively small number of dairy plants. For example, 9 plants were reported as both pasteurizing and bottling milk for fluid use and for butter manufacture. No more than 19 plants were reported as making any one of the dairy products manufactured in the country (i.e., butter, leben, lebenia, yogurt, bryndaz[7], safad[8], and white, hard, and processed cheeses). Most of the plants are equipped to handle the production of more than one product. No plants were reported as being equipped for the manufacture of evaporated, condensed, or dried milk.

Production of Milk and Milk Products Shows Notable Increase

During the agricultural year 1960, total production of cow's milk in Israel is estimated to have been equivalent to 617 million pounds. Compared with the 210 million pounds produced in the agricultural year 1949, this represents an increase of nearly 300 percent. In addition, goat's and sheep's milk increased during the same period from 29 million pounds to 88 million, also about 300 percent. Inasmuch as U. S. exports of nonfat dry milk to Israel increased from 7 million pounds in 1950 to 24 million in 1959, and were as much as 25.7 million pounds in 1957, it would not appear that the importation of American milk powder has been a retarding influence on Israel's milk production. In fact it is quite widely held that the increased availability of milk and milk products resulting from these imports -- together with the emphasis placed on the nutritive value

Total Production of Milk in Israel, 1950-60



[7] Bryndza cheese is a soft cheese made almost exclusively from sheep's milk and usually stored in brine.

[8] Safad, named after the town of Safad in northern Israel, is a semihard, low-fat cheese.

of milk by the Ministry of Education and Culture and the Ministry of Welfare -- has been useful in developing a taste for milk. Thus, U.S. nonfat dry milk has played a significant part in stimulating the demand for and the consumption of milk and milk products.

TABLE 5. -- Milk: Production and utilization, by kinds, agricultural years 1950-59

Year ending September 30	Production			Utilization			
	Cow's milk	Goat's and sheep's milk	Total	Fluid	Industrial	Animal feed	Other[1]
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
1950	209,768	29,431	239,199	208,189	16,673	14,337	--
1951	234,349	34,171	268,520	239,853	13,746	14,921	--
1952	271,320	41,887	313,207	274,285	20,249	18,673	--
1953	291,448	54,454	345,902	293,946	31,713	20,243	--
1954	333,556	68,784	402,340	316,585	59,608	23,501	2,646
1955	361,775	75,452	437,227	331,777	76,716	26,508	2,226
1956	390,214	86,861	477,075	350,684	92,386	31,206	2,799
1957	418,627	93,021	511,648	367,447	105,949	34,740	3,512
1958	492,569	94,621	587,190	382,600	162,470	37,586	4,534
1959	590,401	94,181	684,582	379,077	257,215	41,918	6,371
1960[2]	617,288	88,184	705,472	[3]	[3]	[3]	[3]

[1]Includes milk spilled, wasted, and not otherwise accounted for.
[2]Estimated. [3]Not available.

Statistical Abstract of Israel.

During the shipments of nonfat dry milk to Israel, the rate of increase in domestic production and demand was considerably faster for milk products than for fluid milk. While the quantity of cow's milk used for drinking purposes between 1950 and 1959 increased by 167 percent, the quantity used in manufactured products increased by nearly 240 percent. Table 6 shows the production of selected dairy products in Israel during the agricultural years 1950 and 1959, together with the respective percentage changes. It does not include the production of yogurt and "ice cream," reported for 1959 at 1.6 million pounds and 8.2 million pounds respectively. "Ice cream" is reported as being made with vegetable fat, rather than milk fat and as not made in plants where dairy products are made.

TABLE 6. -- Selected dairy products: Production, agricultural years 1950 and 1959

Dairy product	Year ending September 30 --		Percentage change
	1950	1959	
	1,000 pounds	*1,000 pounds*	*Percent*
Butter	774	5,811	650
Cheese:			
Hard	509	2,509	393
Salted	1,384	3,100	124
Processed	1,543	1,345	-13
Soft (skimmed)	9,398	13,208	41
Soft (whole milk)	2,112	12,524	493
Leben	7,354	9,777	33
Lebenia	21,968	13,157	-40

Food Balance Sheet of Israel, annual issues 1949-50 and 1957-58. *Statistical Abstract of Israel*, 1958-59.

Consumption of Milk Per Capita Varies

On a per capita basis the yearly consumption of milk and milk products in Israel shows considerable variation, as table 7 indicates. Yet, in view of the large number of immigrants that entered Israel at varying rates during portions of this 10-year period, it is surprising that greater variation yearly is not apparent.[9] During 1950-51 milk and other products were rationed. Since then, domestic production of milk has expanded yearly and those supplies have been supplemented by U.S. shipments of nonfat dry milk.

TABLE 7. -- Milk and milk products: Annual per capita consumption, agricultural years, 1950-59

Year ending September 30	Fluid milk[1]	Cream	Butter	Cheese, hard	Cheese, salted
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1950	170.5	--	0.7	2.6	1.1
1951	166.3	--	12.8	4.4	1.1
1952	172.0	--	1.5	1.3	1.5
1953	178.9	--	1.1	1.1	2.0
1954	187.9	6.2	9.9	4.2	2.4
1955	191.2	7.5	7.5	4.2	2.0
1956	193.4	7.9	10.1	4.6	1.5
1957	192.7	8.4	2.2	4.2	2.0
1958	192.3	8.8	2.9	3.3	1.5
1959	184.8	7.5	7.0[2]	2.6	1.3

	Cheese, processed	Cheese, soft (skim milk)	Cheese, soft (whole milk)	Leben	Lebenia
	Pounds	*Pounds*	*Pounds*	*Pounds*	*Pounds*
1950	1.3	7.7	1.8	5.9	18.0
1951	1.3	6.8	2.9	2.6	22.4
1952	1.3	6.6	2.0	0.9	18.0
1953	1.3	6.4	4.4	0.9	14.5
1954	0.7	6.6	5.9	0.7	9.2
1955	0.7	5.9	5.7	0.9	8.6
1956	0.5	6.6	6.4	2.0	7.0
1957	0.7	6.6	6.8	2.9	7.9
1958	0.7	7.0	7.3	3.5	7.0
1959	0.7	6.4	6.2	4.8	6.4

[1]Includes goat's and sheep's milk.
[2]The price of butter to consumers was reduced sharply during this period.

Food Balance Sheet of Israel and *Statistical Abstract*, 1950-59.

Although not shown in table 7, the quantity of imported nonfat dry milk that was recombined and used for drinking purposes in the agricultural year 1959 was 2.6 pounds per capita. The consumption of dry whole milk imported and used in fluid form the same year is reported as equivalent to 0.2 pounds per capita. Based on imports of nonfat dry milk and the percentage of this milk that found its way into foods including uses other than as fluid milk, Israel's average per capita consumption of this product during 1959 and 1960 was approximately 9.5 pounds per

[9]One investigator, Joseph Schiff *(12)*, reported that during the years 1952-57 milk consumption per capita declined. Other data used regarding quantities of milk consumed and population during the respective years indicated seem to account for the difference involved.

year -- probably the highest in the world. Taking into account total consumption of milk as milk and milk products, however, it is apparent that Israel's total is low compared with that of many other countries.[10]

TABLE 8.--Milk and milk products: Annual consumption per capita in selected countries in terms of milk equivalent, 1959

Country	Per capita consumption	Country	Per capita consumption
	Pounds per year		*Pounds per year*
Australia	953	Israel[1]	344
Austria	653	Italy	337
Belgium	922	Netherlands	704
Canada	947	New Zealand	1,322
Denmark	978	Norway	856
Finland	1,313	Sweden	1,068
France	800	Switzerland	989
Germany, West	761	United Kingdom	838
Ireland	1,546	United States	678

[1]Partly estimated.

Based primarily on official statistics of foreign governments and reports of U.S. Foreign Service officers.

For this fact, several reasons have been advanced. One of these is the influx of many immigrants of oriental origin, whose taste for milk is much less developed than that of immigrants from most European countries. The percentage of oriental immigrants among all those born outside Israel has been steadily rising: in 1948, it was 15 percent *(12)*, and currently it is close to 50 percent.

A second reason advanced is that Israel has made milk and milk products available for purchase but appears to have lagged in merchandising and selling. The most has not been made of promotional possibilities; there are real opportunities for expanding consumption outside the schools. One of the most urgent tasks facing the Israeli milk processing industry is improvement in the distribution and sales of milk and dairy products. Greater emphasis will doubtless be given to the development of wholesale routes and sales through stores as well as improved methods of house-to-house retail distribution. Other areas scheduled for increased attention are: Quality control both on farms and in plants, modernization of processing techniques, advertising and merchandising methods, consumer surveys, relationships between plant operators and salesmen, and public relations.

Other reasons given for the lower per capita consumption are the increased supply of competing products such as meat, fish, and eggs which also contain animal proteins, and adherence to Hebrew religious doctrine that precludes the consumption of milk and milk products in conjunction with the use of meats. Average per capita income in Israel during 1958 was apparently the equivalent of $762 compared with $1,946 per capita during the same year in the United States. The reported price that the Israeli consumer paid in 1960 for milk containing 3.0 percent fat was the equivalent of 20.9 cents per quart. In the United States during the same year, the average delivered price of fluid milk approximating 3.6 percent butterfat was 26 cents per quart in single quart containers. More than 26 percent of the families in Israel have electric refrigeration and more than 56 percent have nonelectric refrigeration in their homes.[11]

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[10] After this report had been prepared, the report of Dr. Sarah Bavly *(3)* was available to the author. Table 6 of that report gives the consumption of milk per capita per day in Israel during 1956-57 according to the food survey involved as equivalent to 270 pounds per year, whereas according to the combined Balance Sheets of Israel *(8)* the corresponding consumption as reported was equivalent to 349 pounds per capita per year. Reasons for the differences involved are explained in *(3)* Except as otherwise indicated, the findings presented here are based on and coincide more closely with the Balance Sheet data. Several variations in the basic data, including precise periods of study, cow's milk only as against cow's milk plus other milk, exact products and segments of population included, appear to account largely for differences between the findings reported here and other information available to readers.

[11] Dr. F. Ginor, Bank of Israel, Tel Aviv, Nov. 3, 1960.

Consumption of Animal Protein Per Capita is Low

After studying the consumption of animal protein by income groups and family sizes among wage earners in Israel, Dr. Chaim Mendelsohn of the Ministry of Agriculture[12] reported *(11)* that during the period May 1956-April 1957 each wage earner and each family member averaged 30.6 grams of animal proteins daily. This quantity was well above the 5.3 grams in India and somewhat above the 23.0 grams in Portugal, but markedly below the 42.2 grams in Austria and the 65.9 grams in the United States during the period indicated. Incomplete data for later periods in all the countries shown in table 9 disclose that during 1957-58 Israel's total daily consumption of animal proteins was 33 grams, while that of the United States was 65 grams. The latest available 4-year average of total consumption, shows a decline to 31.4 grams per day for Israel and a rise to 65.6 for the United States.

TABLE 9.--Animal proteins: Daily per capita consumption in specified countries, by type of food, average 1954/55-1956/57

Countries	Milk	Milk products	Meat	Eggs	Chicken	Fish	Total	Average annual income per person[1]
	Grams	*Grams*	*Grams*	*Grams*	*Grams*	*Grams*	*Grams*	*Dollars*
Austria	16.6	4.1	17.1	2.5	0.3	1.6	42.2	667
Belgium-Luxembourg	8.5	8.5	17.9	4.3	.8	3.5	43.5	1,262
Denmark	11.0	10.5	20.3	2.3	.9	7.1	52.1	1,043
Egypt	5.3	--	4.0	.3	.7	2.6	12.9	136
Germany	11.7	7.0	16.5	3.1	.6	3.7	42.6	988
Greece	6.0	6.1	5.4	1.4	.6	3.7	23.2	323
India	4.2	--	.5	.1	--	.5	5.3	68
Israel	6.0	7.2	3.6	5.4	5.5	2.9	30.6	882
Italy	5.6	4.8	7.3	2.4	.6	2.8	23.5	516
Norway	22.4	5.9	13.0	2.4	[2]	9.5	53.2	1,128
Portugal	1.4	.8	5.8	.9	.5	13.6	23.0	224
Turkey	2.3	2.5	5.6	.4	.5	.7	11.0	384
United Kingdom	14.3	4.8	20.1	4.0	1.2	4.4	48.8	1,199
United States	17.5	7.6	27.5	6.4	4.4	2.5	65.9	2,053

[1]Committee for International Economic Growth, *Fact Sheet No. 10*, Washington, 1960, except for U.S. figure, which is based on personal income payments as reported by U.S. Department of Commerce. [2]Included in meat.

Mendelsohn, Chaim, *Animal Protein Consumption Pattern in Israel.* Tel Aviv, 1959. Original source, United Nations Food and Agriculture Organization, *Food Balance Sheets.* Rome, 1958.

According to Dr. Mendelsohn *(11)* milk and milk products provided in rounded figures about 50 percent of the animal proteins consumed in Israel[13] eggs and chicken, 40 percent, and beef 10 percent, excluding fish.[14] This structure did not change as income or family size varied.

Milk a relatively cheap protein source. -- Dr. Mendelsohn *(11)* reported that approximately 50 percent of the monthly expenditures for animal protein were spent on eggs and chicken; 25 percent on beef; 16 percent on milk and milk products; and 9 percent on fish. Thus one gram of beef protein cost the consumer seven times as much as one gram of milk and milk product protein while one gram of protein from eggs and chicken cost half as much as a gram of beef protein and 3.6 times as much as a gram of milk protein.

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[12] Dr. Mendelsohn's study included approximately 4,600 families and 18,000 persons. Large consumption differences existed in Israel among consumers of various income groups and consumers of various family sizes. Discussion of these differences however is not incorporated in this report. Dr. Mendelsohn is currently Agricultural Research Analyst in the American Embassy in Israel.

[13] Dr. Bavly *(3)* found that milk and cheese contributed 37 percent toward animal protein intake.

[14] As indicated in table 9, fish contributes 2.9 grams of animal protein per day to the Israeli diet.

TABLE 10. -- Animal proteins: Monthly per capita consumption in Israel, by income level and type of food, 1956-57

Monthly income of family	Eggs and chicken		Beef		Milk and milk products					
					Milk		Milk products		Total	
	Quantity	Percent of total consumption	Quantity	Percent of total consumption	Quantity	Percent of total consumption	Quantity	Percent of total consumption	Quantity	Percent of total consumption
	Grams	*Percent*	*Grams*	*Percent*	*Grams*	*Percent*	*Grams*	*Percent*	*Grams*	*Percent*
I£0–I£19	182.8	42.9	41.7	11.0	97.1	25.6	78.2	20.6	175.3	46.2
I£20–I£39	219.5	40.8	58.1	10.8	139.7	26.0	120.7	22.4	260.4	48.4
I£40–I£49	298.7	40.5	70.0	9.5	185.1	25.1	183.1	24.8	368.2	50.0
I£50–I£59	341.0	41.0	76.0	9.1	210.2	25.2	205.3	24.7	415.5	49.9
I£60–I£69	373.9	39.8	90.9	9.7	220.0	23.4	254.1	27.1	474.1	50.5
I£70–I£79	388.6	41.2	92.4	9.8	214.4	22.7	248.5	26.3	462.9	49.0
I£80–I£99	409.5	39.5	105.8	10.2	222.7	21.5	297.3	28.7	520.0	50.2
I£100–I£149	445.2	39.0	138.6	12.2	211.9	18.6	344.5	30.2	556.4	48.8
I£150+	420.7	36.2	131.1	11.3	180.3	15.5	431.1	37.1	611.4	52.6
Average	271.1	41.1	70.0	10.6	145.1	22.0	173.9	26.3	319.0	48.3

Mendelsohn, Chaim, *Animal Protein Consumption Pattern in Israel.* Tel Aviv, 1959.

Note: I£1 = US$0.55.

TABLE 11. -- Animal proteins: Monthly per capita expenditure in Israel, by income level and type of food purchased, 1956-57

Monthly income of family	Milk	Milk products	Eggs	Chicken	Meat	Fish	Total	Total purchased	Animal protein as percent of food purchased
	Israeli pounds	*Israeli pounds*	*Israeli pounds*	*Israeli pounds*	*Israeli pounds*	*Israeli pounds*	*Israeli pounds*	*Israeli pounds*	*Percent*
I£0–I£19	0.43	0.47	1.22	1.56	1.18	0.60	5.46	17.81	30.6
I£20–I£39	0.62	0.63	1.66	2.28	1.89	0.92	8.00	22.80	35.1
I£40–I£49	0.84	1.04	2.35	3.28	2.64	1.24	11.39	28.18	40.4
I£50–I£59	0.97	1.20	2.82	3.81	2.94	1.37	13.11	30.76	43.0
I£60–I£69	0.99	1.43	3.09	4.23	3.56	1.49	14.79	33.58	44.0
I£70–I£79	0.98	1.48	3.26	4.53	3.82	1.66	15.73	35.20	44.7
I£80–I£89	1.02	1.67	3.37	4.90	4.40	1.71	17.07	38.16	44.7
I£100–I£149	0.98	1.92	3.89	5.17	6.17	1.81	19.94	44.50	44.8
I£150+	0.85	2.35	3.84	4.82	6.80	2.06	20.72	54.96	37.7
Unknown	0.64	.85	2.02	2.93	2.52	1.20	10.16	25.48	39.9
Average	0.82	1.19	2.60	3.56	3.21	1.32	12.70	30.95	41.0

Mendelsohn, Chaim, *Animal Protein Consumption Pattern in Israel.* Tel Aviv, 1959.

From the foregoing Dr. Mendelsohn concluded that the consumer apparently preferred eggs and chicken to beef and milk, using nearly half of his expenditure for animal proteins on the former, despite their high prices as compared with milk. Thus, expanding milk production would provide relatively cheap protein to the consumer.

A further finding was that for all families, the consumption of fluid milk increased at a fast rate along with income, but only up to a per capita income level of I£60 per month, after which milk consumption remained at a more constant level. On the other hand the increase in the consumption of eggs, chicken, and milk products continued as income went up, although the rate of increase decreased at the upper income levels. Thus, Dr. Mendelsohn concluded that surpluses of milk may be better absorbed in the form of milk products than as fluid milk, which may be

distributed among the lower income groups, where there is still room for an increase in consumption.

U. S. Milk Helps Improve Nutrition

School feeding programs benefit. -- Although, as previously indicated, smaller shipments of U.S. nonfat dry milk were made to Israel for school lunch purposes before 1955, 1.07 million pounds on the average have been sent to that country for this purpose every year since then.

The first child feeding program in Israel was introduced by the Hadassah Women's Organization in 1923 when a school lunch project was started in the Old City of Jerusalem and in Tiberias to provide additional food for undernourished children [5]. Since then the scheme has become a countrywide project which in 1950 was transferred to the central government. Currently it is conducted by the Nutrition Department within the framework of the Ministry of Education.

School lunch and milk-in-school projects are of particular importance for immigrant families, which not only find it economically difficult to provide for their children's nutritional needs but are also not cognizant of the modern principles of nutrition. In addition, many children have arrived in a "severely undernourished condition." The objective under these programs is to raise the standards of nutrition and homemaking in the country. Under the nutrition education and child feeding programs the activities include the training of dieticians and teachers of nutrition and home economics and providing guidance in those subjects to housewives and young women. Related directly to the schools are the functions of teaching nutrition and home economics to pupils in elementary and secondary schools, and of actually feeding the children -- an activity which includes (a) feeding in schools, nursery schools, and Infant Welfare Stations (b) the milk-in-school project (c) feeding in summer day-camps and the supervision of nutrition in children's institutions.

Nutrition is taught in every elementary school where a teaching kitchen has been established and a full-time teacher has been engaged to teach foods and nutrition. The total number of such schools in the country is currently 210. Schools without teaching kitchens number 250. More than 950 schools are served from central kitchens. In addition, there are 160 children's institutions where feeding is supervised. This makes a total of 1,570 institutions included in the feeding program.

Noon meals in schools are provided to needy children as recommended by the local social service bureau, and also to nonneedy children in so far as they cannot obtain an adequate noon meal at home because their mothers are working, because they live far away from the school, or because of faulty food habits. The school meal is prepared either by the pupils under guidance of a teacher or by a kitchen manager and her helpers in case the size of the school does not warrant a full-time nutrition teacher. The standard average school meal as determined by the Nutrition Department contains from 25 to 60 percent of the child's daily requirements.

Average composition of the meal in 1958-59 was as follows:

Milk	200 grams	Bread	100 grams
Fish	20 grams	Cereals, legumes	30 grams
Cheese	20 grams	Sugar	15 grams
Eggs	1/10 unit	Oil, margarine	10 grams
Fruit and vegetables	140 grams		

The nutritional value of these items, expressed as a percentage of the daily nutritional requirements of a 10-year-old child, is as follows:

Calories	33	Thiamin	60
Protein	50	Riboflavin	52
Calcium	46	Niacin	28
Iron	37	Ascorbic Acid	60
Vitamin A	78		

The milk-in-school project similar to the noon meal project in organization, is also subsidized and supervised by the Nutrition Department. Under this program a cup of cocoa is served at 9:00 a.m. in many schools throughout the country, to all the children without exception. The cocoa is prepared from U. S. nonfat dry milk with the addition of cocoa and sugar. A serving contains 20 grams of milk powder and is designed to contribute considerably to the protein,

calcium, and riboflavin intake of the children. U. S. nonfat dry milk is also used in the school lunch meal in the preparation of soups, custards, and other cooked foods. Either domestically produced pasteurized whole milk or nonfat dry milk may be served in fluid form in the school lunch meal depending on the local supply of milk.

TABLE 12. -- School lunch and milk-in-school programs: Number of children served, by type of institution, 1958-59

Type of institution	Type of nourishment	Number of children served	Percent of all children in each type of institution
Elementary schools	Full meal	88,000	23
Kindergartens	Full meal	29,000	40
Infant welfare stations	Full meal	3,000	5
Elementary schools	Cup of cocoa	75,000	20
Summer camps	2-3 full meals	60,000	16

[Reprint.]
Henrietta Szold Institute, *Child and Youth Welfare in Israel.*

In November 1960, the number of children served full meals daily in elementary schools, kindergartens, and infant welfare stations was 130,000; 100,000 children in elementary schools were served a cup of cocoa daily; and 60,000 were receiving from two to three full meals daily in summer camps, where the program runs for one month of the summer vacation. Also, as of this more recent date, 1,410 schools and 160 children's institutions where feeding is supervised were participating in the program.

In the development of the school lunch and milk-in-school programs the United Nations Children's Fund has played an important part, originally by channeling U.S. nonfat dry milk, cheese, and other foodstuffs that were made available in Israel without cost, and later by assisting in the expansion of both these projects. Hadassah has also participated in supplying dairy and other products to schools. In recent years, however, the U. S. nonfat dry milk made avail-

Under the Milk-in-School project, these children are starting their day by drinking a cup of cocoa made with U.S. nonfat dry milk.

able for school use has been handled through CARE.

The slightly more than a million pounds of U. S. nonfat dry milk exported to Israel annually on the average since 1955 for use in schools is made available to the Israeli Government free of cost at the port of Haifa on the Mediterranean Sea. Accordingly the only cost to the government is local storage and the cost of transportation from Haifa to the various schools. In reconstituting this milk for drinking, a flavor, such as cocoa, raspberry, or coffee, and sugar are added to increase the palatability. The milk is served hot in winter and cold in summer. A liter of reconstituted liquid is divided into five portions.

In the majority of places, the budget to finance the school lunch program is the responsibility of the local authorities, which receive a monthly subsidy from the Department of Nutrition. In about 30 places where the local authority is not yet strong enough financially, the whole school lunch is maintained by the Nutrition Department. Currently the Central Government is spending I£6 million (the equivalent of approximately US$3.3 million) on the program. This is supplemented by another I£5 million (US$2.8 million) from local authorities such as towns or villages and from parents.

In the administration of the school lunch and milk-in-school programs, emphasis is given to needy children; but, to avoid embarrassment, a certain number of nonneedy children (about 12 percent) are always deliberately included when the meal or milk is served. Each child pays according to the capacity of his parents as assessed by the social worker. This amount may cover from 6 to 100 percent of the total cost.

Although national studies in this area are lacking and specific proof has not been documented, school officials are most enthusiastic regarding the extent to which U. S. nonfat dry milk has helped to increase the appetite for and the consumption of milk among recipients. This enthusiasm cannot help but be reflected in the broader base of the homes as the use of milk in the schools is discussed here. The contribution of U. S. nonfat dry milk to nutrition in the schools is brought more clearly into focus when consideration is given to the large number of children of oriental origin in Israel's schools (about 48 percent of the total) who, without previous experience with commercial milk are being made aware of its nutritive value and who would not have been able to afford to purchase milk in the open market. Additional light on the actual contribution that milk is making to nutrition in Israel should be forthcoming from the results of a study currently being made of milk consumption in that country. This study, understood to be sponsored by UNICEF, is being carried on by the Department of Nutrition.

U. S. milk for needy channeled through dairies. -- In addition to the U. S. nonfat dry milk made available to Israel free of cost for use through the schools, approximately 11.3 million pounds have been imported into that country since 1955 for distribution through approved welfare agencies. Nonfat dry milk for distribution to needy persons outside the school feeding program has been channeled primarily through the Malben, Hadassah, and CARE organizations. Inasmuch as the nonfat dry milk for both school feeding and for use through welfare agencies is shipped from the United States to Israel under Title III of P.L. 480, all such shipments are subject to approval by the United States Operations Mission in Tel Aviv.

Nonfat dry milk used for drinking must be reconstituted, and needy recipients are not usually familiar with the best method of doing this. Hence the Ministry of Welfare, which administers this program, has contracted with dairies to receive the nonfat dry milk designated for welfare use and to deliver milk products in return to shops which made them available free of cost to needy persons holding certificates to receive them. The products are usually in the form of one of the soft cheeses or leben or lebenia. In this way preschool children, aged people, and families with children under the social services may receive milk products that otherwise would not be available to them. In this way, too, a higher degree of sanitation in handling the nonfat dry milk is insured.

During 1959 the Ministry of Welfare reached approximately 46,000 people through roughly 5,000 institutions. In 1960 the quantity of nonfat dry milk received in Israel for this purpose was reduced by nearly one-half and the number of people reached was reduced in about the same proportion. The intensity of the complaints made by the Ministry regarding this curtailment attests in part to the importance placed upon the program by local authorities.

Israel's Plan Is For Self-Sufficiency

Preliminary plans for agriculture in Israel during the second decade ending in 1968 provide for an increase in production sufficient to supply the growing population with an adequate supply of basic foods including milk. The goals sought would also increase the supply of raw materials for food processing and of farm products for export. The targets to be accomplished in the dairy industry during the period indicated are clear: 80,000 milk cows and a milk output exceeding 750 million pounds a year. This larger output is expected to cover the needs of a population which by that time would approximate 3 million people; it also allows for an increase in per capita consumption as newcomers acquire new food habits. The number of cattle for meat production would also be increased to more than 40,000 head to fill the need for beef; poultry and egg production too would be expanded.

There appears to be little doubt that because of the degree of control exercised by the government and the Israel Dairy Board, these goals will be reached. From the standpoint of a potential market for U. S. dairy products in that country, this is significant. The avowed objective of the dairy industry is to preserve the "local market for local production." Milk marketing cooperatives, private organizations, the Israel Dairy Board, and the Ministry of Agriculture appear to be working in harmony to this end. Accordingly, prospects for dollar sales of U. S. nonfat dry milk or other dairy products to Israel in either the near future or the longer term are clearly not in evidence. Four thousand tons of nonfat dry milk have been requested by the Government of Israel to be shipped under Title I of Public Law 480 during the fiscal year ending 1962. Should the planned increase in Israel's milk production materialize, the quantity to be requested after that date -- even involving the use of foreign currency -- may be greatly reduced.

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